

REMARKS

Status of the Claims

Claims 34-35, 37-40, 42-44, 46, 49-51, and 54-55 are pending in the present application, Claims 1-33 and 36 having been previously canceled, Claims 41, 45, 47, 48, 52, and 53 having been cancelled in the present amendment, and new Claims 54 and 55 having been added in the present amendment. Claims 34, 35, 37, 39, 40, 42, 43, 45, 46 and 51 have been amended to more clearly define the invention.

Completeness of the Present Office Action

In the preliminary amendment filed November 28, 2005, applicants specifically traversed the Examiner's rejection of Claims 52 and 53, as being directed to a non-elected invention. Applicants specifically illustrated how the claims originally elected encompass a set of labeled probes. The Examiner maintained the restriction (i.e., continued to assert that Claims 52 and 53 had been withdrawn from consideration) without articulating any basis for not considering applicants' traversal.

MPEP 707.07(f) specifically notes the following:

In order to provide a complete application file history and to enhance the clarity of the prosecution history record, an examiner must provide clear explanations of all actions taken by the examiner during prosecution of an application.

Where the requirements are traversed, or suspension thereof requested, the examiner should make proper reference thereto in his or her action on the amendment.

Where the applicant traverses any rejection, the examiner should, if he or she repeats the rejection, take note of the applicant's argument and answer the substance of it. (Emphasis added).

Applicants respectfully request the Examiner to either examine Claims 52 and 53, or to answer the substance of applicants' traversal of the Examiner's position in regard to these two claims.

Rejections of Claims 34, 35, and 37-51 under 35 U.S.C. § 112

The Examiner has rejected Claims 34-51 under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter that applicants regard as their invention. In particular, the Examiner asserts that the term "labeled probe" is indefinite. The Examiner further asserts the step (b) of Claim 34, and steps (a) and (b) of Claim 42

1 are indefinite. In the light of the amendments and the discussion presented below, applicants
2 respectfully disagree for the following reasons.

3 The Standard for Indefiniteness & Piecemeal Examination

4 The Examiner has issued numerous indefiniteness rejections during the prosecution of the
5 present application. While some of the rejections appear justified, others do not appear reasonable
6 when analyzed with respect to the ability that one of ordinary skill in the art would have to ascertain
7 the scope and meaning of the claims.

8 MPEP 2173.02 discusses how a question of indefiniteness is to be analyzed. In particular,
9 MPEP 2173.02 indicates that "Some latitude in the manner of expression and the aptness of terms
10 should be permitted even though the claim language is not as precise as the Examiner might desire."
11 Furthermore, MPEP 2173.02 makes it clear that definiteness of claim language must be analyzed, not
12 in a vacuum, but in light of:

- 13 (A) *The content of the particular application disclosure;*
- 14 (B) *The teachings of the prior art; and*
- 15 (C) *The claim interpretation that would be given by one possessing the ordinary level of
16 skill in the pertinent art at the time the invention was made.*

17 Clearly, the claim language need not be the best possible claim language, but must merely be
18 ascertainable to one of ordinary skill in the art. Applicants respectfully submit that the Examiner
19 does not appear to be willing to provide applicants much latitude in choice of expression. With
20 respect to at least some of the most recent indefiniteness rejections, it appears that one of ordinary
21 skill in the art should not have any trouble interpreting the claims. Should the Examiner feel it
22 necessary to maintain any current indefiniteness rejections, or raise further indefiniteness rejections,
23 applicants respectfully request the Examiner to articulate why one of ordinary skill in the art, given
24 the disclosure of the present application taken in its entirety, and the well-known teachings of the
25 prior art, would be unable to interpret and understand the language at issue, in regard to ascertaining
26 the scope of the protection provided by applicants' claims.

27 The Indefiniteness of the Term "Labeled Probe" in Claims 34 and 42

28 The Examiner has asserted that the term "labeled probe" is indefinite because it is not clear
29 whether the optical signaling component, which is part of the labeled probe, functions as the label.
30 While applicants have amended the claims to replace the term "labeled probe" with the term "probe,"

1 it appears that an artisan of ordinary skill in the art would not have had any trouble ascertaining the
2 scope of the claims (or more specifically, in ascertaining that the optical signaling component does
3 indeed function as a label). The specification as filed clearly describes a labeled probe as including a
4 binding element and a signaling component. FIGURES 2A-2G illustrate various exemplary
5 embodiments of labeled probes. The specification discussing these Figures clearly uses the term
6 “labeled probes” and clearly describes each labeled probe as including at least a binding element and
7 at least one signaling component. The specification clearly describes preferred signaling elements as
8 being optically discriminable. There does not appear to be a reasonable basis to conclude that one of
9 ordinary skill in the art would not understand that a labeled probe includes a binding element and a
10 signaling element, or that the optical signaling component is the portion of the probe that corresponds
11 to the label (the function of the binding element is clearly disclosed as enabling the probe to
12 selectively bind to a particular type of feature, and the optical signaling component is clearly
13 described as enabling a particular feature to be identified, thereby labeling the feature).

14 While applicants have addressed this issue by eliminating the term labeled probe, the claims
15 are now less descriptive than they would be by employing the term labeled probe. Amending the
16 claims to recite “optically labeled probes” and “optical labeling components” might have otherwise
17 addressed the issue, but in applicants’ opinion, such an amendment would be problematical,
18 particularly because that is not the language applicants used in the specification as filed (and possibly
19 could have invited a written description rejection under the first paragraph of 35 U.S.C. § 112).
20 There simply does not seem to be a reasonable basis for concluding that an artisan of ordinary skill
21 would not be able to ascertain the subject matter being claimed. Applicants may not have used the
22 *best* possible of all language, but the language employed certainly does not seem to render the scope
23 of the claims indefinite.

24 Indefiniteness of Step (b) in Claims 34 and 42

25 The Examiner further asserts that Claim 34 is indefinite because of an inconsistency between
26 step (a) and step (b) in the claim, such that step (b) appears to lack antecedent basis. Specifically, the
27 Examiner notes that step (a) recites *at least one optical signaling component*, and step (b) recites a
28 plurality of different optical signaling components.

29 With respect to a lack of antecedent basis, it must be recognized that indefiniteness can only
30 be analyzed in light of what one of ordinary skill in the art would understand given the scope of the

1 disclosure as filed and the state of the prior art. Furthermore, with respect to antecedent basis in
2 particular, MPEP 2173.05(e) states: “*Obviously, however, the failure to provide explicit antecedent*
3 *basis for terms does not always render a claim indefinite. If the scope of a claim would be*
4 *reasonably ascertainable by those skilled in the art, then the claim is not indefinite.*

5 Applicants have previously provided an articulation of why steps (a) and (b) are not
6 inconsistent (in traversing the Examiner's previous rejection of Claims 34 and 42 as being indefinite
7 based on a belief that steps (a) and (b) were inconsistent). The Examiner appears to have modified
8 the rejection to now assert that Claims 34 and 42 are indefinite because steps (a) and (b) do not
9 employ identical language (i.e., antecedent basis is lacking). As noted above, identical language is
10 not required so long as one of ordinary skill in the art would be able to ascertain the scope of the
11 claim. The Examiner has not provided any articulation as to why one of ordinary skill in the art
12 would be unable to ascertain the scope of the claims, particularly given the detailed explanation
13 provided in applicants' specification as filed (which specifically describes different mechanisms by
14 which a plurality of different optical signaling components can become bound to the same feature).

15 Furthermore, identical language would not be appropriate, because applicants are not referring
16 to the same element. Step (a) requires providing a probe consistent with specific recited conditions.
17 Step (b) requires that a plurality of different optical signaling components become bound to a
18 particular feature. In fact, step (b) uses clear language to indicate that a ***particular condition*** must
19 exist to enable a plurality of different optical signaling components to become bound to the same
20 feature. The language of Claim 34 (similar language is included in Claim 42) is as follows:
21 “*exposing said object to said at least one probe under conditions that cause...a plurality of different*
22 *optical signaling components to become bound to said feature....*” The specification as filed clearly
23 discloses the specific conditions that are required. One example describes two conditions in which a
24 plurality of different signaling components can become bound to the same feature. Either a plurality
25 of probes, at least one of which includes a different optical signaling component, can be bound to the
26 feature, or a single probe including two different optically signaling components can be bound to the
27 feature. Significantly, the probes employed in each of the two specifically identified conditions are
28 entirely consistent with the probe explicitly defined in step (a).

29 With respect to the first condition under which the recitation of step (b) can be achieved, two
30 (or more) labeled probes (note that two or more labeled probes is entirely consistent with *providing at*

1 *least one labeled probe*) are provided, where each of the two (or more) labeled probes includes a
2 different optical signaling component (see feature 3 of FIGURE 2D). FIGURE 2D clearly illustrates
3 a plurality of labeled probes 412c attached to a plurality of binding sites 428a-428c of feature 3. The
4 labeled probes attached to binding sites 428a and 428b each includes signaling element 410a, while
5 the labeled probe attached to binding site 428c includes signaling element 410b.

6 Referring now to the second condition under which the recitation of step (b) can be achieved,
7 note that one labeled probe including two different optical signaling components (see feature 3 of
8 FIGURE 2B) can be provided. FIGURE 2B clearly illustrates a labeled probe 412c bound to a
9 feature 418. Labeled probe 412c includes two different optical signaling components, signaling
10 element 410a and signaling element 410b.

11 Thus, FIGURES 2B and 2D each shows a single feature to which a plurality of different
12 signaling elements have been bound. In FIGURE 2B, a single probe including a plurality of different
13 signaling elements has been bound to a feature. In FIGURE 2D, a plurality of labeled probes, each
14 labeled probe including only one signaling element, is bound to a feature such that the feature is
15 labeled with a plurality of different signaling elements. Claims 34 and 42 have been crafted to define
16 a method encompassing both of the above described exemplary embodiments.

17 While such claim language could be considered unconventional, there is nothing inherently
18 wrong with the language, it is clear, and does not violate any rules of patent drafting. While the
19 Examiner may not prefer such language, the test for determining whether an indefiniteness rejection
20 is reasonable is not based on conventional language or the Examiner's preference for a particular
21 phrase or style of language, but instead is based on whether the language used conveys the scope of
22 the claim protection being sought to one of ordinary skill in the art. The scope of protection provided
23 by the language used in the claims is ascertainable by one of ordinary skill in the art, particularly
24 given applicants' disclosure, which precisely describes the conditions enabling this approach to be
25 achieved.

26 It must be recognized that step (a) simply recites providing at least one probe. Step (b)
27 specifically recites that after exposure to conditions causing one or more probes to be bound to a
28 feature, a plurality of different optical signaling components will be bound to the probe. Two
29 distinctly different mechanisms for achieving that condition have been described in detail in the
30 specification. Both mechanisms are entirely consistent with the recitation of steps (a) and (b).

1 Accordingly, the rejection of Claim 34 under 35 U.S.C. § 112, second paragraph, as being indefinite
2 because step (b) lacks antecedent basis, should be withdrawn. The same logic applies to the rejection
3 of Claim 42, and that rejection should also be withdrawn.

4 Rejection of Claims 34-51 under 35 U.S.C. § 102

5 The Examiner has rejected Claims 34, 35, and 37-51 under 35 U.S.C. § 102 as being
6 anticipated by Garini (U.S. Patent No. 6,066,459). The Examiner asserts that Garini discloses each
7 element of applicants' claimed invention. Applicants respectfully disagree for the following reasons.

8 Applicants have significantly amended independent Claims 34 and 42, to incorporate the steps
9 of spectrally dispersing the collected light, and simultaneously generating a plurality of images based
10 on the spectrally dispersed light. Garini does not teach or suggest the steps of spectrally dispersing
11 the collected light, or simultaneously generating a plurality of images using the spectrally dispersed
12 light.

13 Garini employs collimating optics to simultaneously collect light from all optical signaling
14 components, and then directs that collected light through an interferometer before generating the
15 image. The output of an interferometer is an interferogram (see column 4, lines 13-33). Garini refers
16 to the set of all interferograms collected during a single scan as a spectral cube of data (column 7,
17 lines 1-45, particularly line 43). Essentially, during data acquisition, Garini's interferometer is acting
18 as a tunable filter, selectively removing a narrow waveband from the light used to form an image of
19 the object. Once all the sequentially obtained interferograms have been collected, image processing
20 can be performed to generate the spectral image shown in FIGURE 6B. This aspect of Garini's
21 optical system that includes an interferometer is described at column 34, line 59 through column 35,
22 line 21. Note in particular that this section of Garini specifically states that *at each instant, each of*
23 *the detector elements is the image of one and always the same pixel of the cell nucleus for the entire*
24 *duration of the measurement, and provides for recording signals of each of the detector elements as a*
25 *function of time using a recording device to form a first spectral cube of data.* Thus, an
26 interferometer requires relatively long data acquisitions times due to the scanning functionality
27 inherent in the application of the interferometer described by Garini, and it is critical that the position
28 of the object relative to the detector remain constant during scanning. Garini specifically teaches that
29 an acquisition time is typically 25 seconds, and can be as long as 50 seconds (see Table 1,
30

1 column 16). Garini's technique is thus based on collecting a plurality of different spectral images
2 *sequentially over time* (i.e., not simultaneously).

3 As amended, Claims 34 and 42 each specifically recite that the spectrally dispersed light is
4 used to *simultaneously* generate a plurality of images. This claimed approach is entirely consistent
5 with the imaging system described in the specification. Garini does not appear to generate a plurality
6 of spectrally dispersed images at all. Instead, Garini generates a single image and uses a plurality of
7 time-sequential interferograms. The plurality of interferograms are produced over a period of time
8 (the acquisition time, or scanning time).

9 This difference between Garini and the recitation in applicants' claims is not insignificant.
10 Note that Garini specifically teaches that it is important to keep the relative positions of the sample
11 and the detector fixed so that a pixel on the detector always corresponds to a specific location on the
12 object during scanning. When the sample/object is fixed in position, the sampling/acquisition time
13 required by the interferometer does not present any disadvantage. However, an interferometer is
14 inferior to a spectral dispersing element (whose use is recited in applicant's independent claims as
15 amended), because the spectral dispersing elements enable data corresponding to a plurality of
16 images to be collected by the detector simultaneously. This particular advantage is important because
17 the data are being acquired *when there is relative movement between the imaging system and the*
18 *object*, a condition specifically contemplated in the teachings of the specification.

19 The cited art does not teach or suggest replacing the interferometer disclosed by Garini with a
20 spectral dispersion element, or simultaneously detecting a plurality of spectrally dispersed images. It
21 is not apparent that such a modification would solve any problem recognized in the art. Thus,
22 independent Claims 34 and 42 patentably distinguish over the cited art. Each claim depending upon
23 Claims 34 and 42 is patentable for at least the same reasons. Accordingly, the rejection of Claims 34-
24 35, and 37-40, 42-46, and 49-51 as a being anticipated by Garini should be withdrawn (Claims 41,
25 47, and 48 having been canceled in the present response).

26 Dependent Claim 50 recites that a specific feature is uniquely discriminable based on an
27 intensity of the optical signaling components. This feature is disclosed and illustrated in the present
28 application in connection with FIGURE 2C. While Garini discloses detection of multicolored probes,
29 it is not clear that Garini teaches or suggests being able to distinguish intensity among multicolored
30 probes. Garini discloses how to identify a probe including a red component and green component.

However, it is not clear that Garini can distinguish a probe that includes more red than green, from a probe that includes more green than red. Because Garini does not appear to teach or suggest this type of intensity coding, Claim 50 appears to patentably distinguish over the cited art for this additional reason.

Patentability of Newly Added Claims 54 and 55

Applicants have added new Claims 54 and 55 in the present amendment. Claim 54 is based on Claim 34, while Claim 55 is based on Claim 42. Each newly added claim incorporates the additional limitation that there is relative motion between the samples/object and the apparatus acquiring the light (Claim 54), or the apparatus detecting the signal (Claim 55). The third paragraph on page 6 of the specification specifically discusses relative motion between the object in the imaging system. As discussed in detail above, Garini's interferometer requires a relatively long acquisition time, and as a result, Garini's technique is suitable for stationary objects, but not usable in a system or method where there is relative motion between an object and the imaging system/detector. Accordingly, Claims 54 and 55 are patentably distinguishable over the cited art.

Accordingly, all of the claims now remaining in the application define patentable subject matter that is neither anticipated nor obvious in view of the prior art cited. The Examiner is thus requested to pass the present application to issue in view of the amendments and the remarks submitted above. If there are any questions that might be addressed by a further telephone interview, the Examiner is invited to telephone the undersigned attorney, at the number listed below.

Respectfully submitted,

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MCK/RMA:elm